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up by the ichthyologists at Stanford. As far as we are able to learn, the ornithological results of the expedition were relatively unimportant.

PUBLICATIONS REVIEWED

The present reviewer cannot remember to have ever read a book more profitable, and at the same time entertaining, than BEEBEE'S "THE BIRD".¹ The brief title at first glance seems to lack sufficient definiteness as to the real nature of the subject-matter. The book has nothing to do with systematic ornithology: species are mentioned merely incidentally; but a multitude of subjects related to evolution and adaptation are dealt with. After all, as we think it over, the book does treat of *the bird*, inclusively and broadly. Yet one must have read and studied the whole book to comprehend its scope.

Our first pleasure was in simply "looking at the pictures." Every one of the 371 illustrations are significant *per se* of some fact of bird structure or habit: One does not have to read the context to gain at least some suggestion of what the pictures are meant to show. There is every indication that Mr. Beebe has spent plenty of time in securing the most instructive photos for the bringing out of each desired point.

And the text is as good as the pictures. The style is non-technical, but not too "popular" in most places. Here and there, there is a shade too much of literary ornateness, which to our minds does not strictly harmonize with the scientific treatment of a subject. But this is so inconsequential a criticism, that we feel almost ashamed to have ventured it.

The following are a few of the subjects discussed: The ancestors of birds; growth and structure of feathers; framework of a bird; organs of nutrition (tongues, crops, gizzards); food and feeding-habits of various birds; breath of a bird; senses; wing-structure and flight; theories of coloration; the bird within the egg.

Beebe's "The Bird" is an extraordinary book, and we advise our readers to get this one above any other work on birds of the same size.—J. G.

"THE PROTECTION OF OUR NATIVE BIRDS" is the title of a pamphlet ² by Professor MONTGOMERY of the University of Texas. In the publication and distribution of such carefully

¹ The Bird | Its Form and Function | By | C. William Beebe | Curator [etc., 4 lines] | with over three hundred and seventy illustrations | chiefly photographed from life | by the author | [vignette] | New York | Henry Holt and Company | 1906; pp. xii—496, 1 plate, 371 text figures.

² The Protection of Our Native Birds | By | Thos. H. Montgomery, Jr. | Professor of Zoology [Bulletin of the University of Texas No. 79, Scientific Series No. 8; Oct. I, 1906; pages 30].

and convincingly drawn up papers as this, can the educational centers of each state do much to spread the cause of bird protection. As Professor Montgomery suggests, it is thru the schools that the knowledge of the value of birds can be emphasized at large. Nature courses in the lower grades are most productive of widespread good, it has seemed to us. The economic value of bird-life is what will appeal, by way of the school children, to the adults of the community.

The present paper presents the subject strongly, and cannot fail to have its good effect. So good a service has thus been done by Professor Montgomery that we are quite ready to pardon his extreme attitude in respect to collectors. It is too bad, tho, that people have to go to extremes! —J. G.

In a profound essay on "THE PROBLEM OF THE ORIGIN OF SPECIES," Professor C. O. WHITMAN briefly reviews ³ the progress of our knowledge of the methods of species-formation, and contributes to their further understanding. While agreeing that the majority of animals may be subject to ordinary or fluctuating variation (that is, variation uniformly in all directions), and that evolution in such cases seems to be solely directed by natural selection (or survival of the fittest), Professor Whitman maintains that further, in some cases at least, there is *orthogenesis* as a result of continuous asymmetrical or "definite" variation.

Orthogenesis, as the present reviewer understands it, is the evolution of a linear series of descendants in a definite direction (as regards some one or more specific characters), irrespective of the Darwinian essential of fitness or unfitness and resulting persistence or elimination of individuals. This would conveniently account for the very beginnings of certain structures, now clearly adaptive, but of which we cannot imagine a series of useful rudimentary stages.

Professor Whitman has been a strong advocate of experimental evolution and is himself at work along that line. For the past ten years he has had under constant observation a succession of generations of the common pigeon (*Columba livia*). Supplementing these, he makes use of specimens of all available wild species of pigeons and doves. He has selected, for reasons of convenience, as characters for observation, the color-patterns shown on the outer surface (coverts) of the wing. The endeavor was to find a case where he could trace the history of one particular specific character. An ideal case seemed to be provided by the

³ The Problem of the Origin of Species | By Charles Otis Whitman [Reprinted from "Congress of Arts and Sciences, Universal Exposition, St. Louis, 1904", Vol. V; pages 18 (repaged?)].

pigeon. The origin of the barred wing-pattern is thought to have been from the uniformly checkered style. Both patterns, by the way, occur among domestic pigeons!

Several sources of evidence are adduced to lead to this conclusion. One is that different wings (of *Columba livia*) may be arranged so as to show uninterrupted gradation from one extreme to the other. Another source of evidence is obtained by comparing in a similar way different wild species. We venture to suggest that neither of these sources of evidence show anything as to the direction of variation *thru time*; and this, it seems to us, would be the crucial point to be proven.

Another source of evidence is based upon the axiomatically-accepted idea that the male plumage is the most specialized (farthest evolved), the female next, and the juvenile least (that is, most primitive). This sequence, apparently in harmony with the orthogenetic theory, is shown in the wing-patterns of many wild species of pigeons, and Professor Whitman places much value upon this as indicating the direction of the development of the characters.

But we would object that it seems just as clear, in a great many species of birds, that the *juvenile* plumage is the *specialized* one (for the sake of protection), the female often as much, or nearly as much, specialized (and for a similar reason), and the male, therefore, the most *generalized*! This reverse theory accords better with the demands for survival, and would therefore be explainable by natural selection. There are many adaptive structures in the young, lost in the adult because useless; for instance, the calcareous nodule on the tip of the chick's bill. Ontogeny does not repeat phylogeny in every detail.

The best point in proof of the theory of orthogenesis was obtained thru the breeding and selection of tame pigeons. It was found that artificial selection could accomplish the reduction of the number of checkers, but would never lead from bars to checkers. The author concludes from this that "the direction of evolution can never be reversed." Hence the direction of evolution in the present case is from the checkered pattern towards the barred. As there seems to be no significance at present for these markings (either directive or protective), they appear to the author to exhibit an instance of orthogenesis. We must confess that, while we do see several such cases of traits exhibited in progressive series (if properly arranged), we do not clearly see evidence of an active variation *thru time* in any one direction.

We are pleased to remark that Professor Whitman, after careful consideration, concedes but little probability to the frequent occurrence of mutations, according to the theories upheld

by Hugo de Vries. Mutation, the abrupt appearance of new species without gradual successive and continuous transitional stages, must be rare among birds, if it occurs at all.

However, we cannot here take space to carry on a discussion of the problem of the origin of species, which is still the greatest problem in biology. What a field there is in ornithology for the student of evolution! The very fact that birds have been so thoroly worked systematically and geographically is all the more reason why this is a particularly advantageous field for such studies. And yet we hear of young men at college being advised to direct themselves to investigation in any other group than birds: "Birds are too well worked!"—J. G.

MINUTES OF COOPER CLUB MEETINGS NORTHERN DIVISION

NOVEMBER.—The Club met November 24, 1906, in the Barbara Jordan Library of Ornithology at Stanford University, California.

Vice-president Fisher occupied the chair. The minutes of the previous meeting were read and approved. The following proposals for membership were made: John W. Martin, 339 N. First St., San Jose, Cal., by D. A. Cohen; Miss Flora A. Randolph, 1706 Walnut St., Berkeley, Cal., by D. A. Cohen; Prof. O. P. Jenkins, Stanford University, Cal., by H. O. Jenkins.

The following were elected to active membership: Chas. Reining, 601 Webster St., Palo Alto, Cal.; F. W. Weymouth, 326 Lytton Ave., Palo Alto, Cal.; John E. Thayer, Lancaster, Mass.; Henry F. Duprey, 919 Morgan St., Santa Rosa, Cal.

Nominations for officers for 1907 were made as follows: President, Dr. F. W. D'Evelyn; senior vice-president, Bertha L. Chapman; junior vice-president, Rollo H. Beck; treasurer, H. T. Clifton; secretary, H. O. Jenkins.

The program was now taken up. Prof. V. L. Kellogg favored the Club with an interesting resume of his forth-coming work on the Mallophaga, touching particularly on the peculiar distribution and habits, and the resulting formation of species, of these external bird parasites. N. K. Carpenter read a paper entitled, "A Season with the Pacific Horned Owl", and brought out some very interesting facts in regard to the life history of this bird.

Mrs. Park then spoke to the Club concerning the passage of a Bird and Arbor Day Bill in the California Legislature. Thereupon the following resolutions were adopted:

WHEREAS it has come to the knowledge of the Cooper Ornithological Club that an effort will be made to establish in the State of California, by act of Legislature, a Bird and Arbor Day, to be observed by the Public School children; and

WHEREAS, the observance of this day is not to be made